

**Abstract of the Disclosure**

5 An integrated photonic apparatus that includes a glass substrate having a major surface, wherein the glass substrate includes a plurality of regions, each region having a different index of refraction, including a first region having a first index of refraction and a second region having a second index of refraction lower than the first index of refraction, and a first waveguide formed along the major surface of the substrate, wherein the first waveguide has a higher index of refraction than an intrinsic index of refraction of adjacent portions of the substrate, and wherein the first waveguide passes through the first region and through the second region of the glass substrate.

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